REMARKS

Claims 1, 2, 9-14, and 21-33 remain in the application.

The Examiner has objected to the specification at page 14, lines 1-3 because of an incorrect calculation. This passage has been corrected and has been further amended in ways apparent to the ordinary artisan to carefully define terms found in the claims. The Examiner has objected to Claim 4 because of an apparent word processing error at the end of the claim. The claim has been canceled.

The Examiner has rejected Claim 17 under 35 USC §112, ¶1 because the creation of a DC bias is not found in the specification. The corresponding passage on page 5 has been amended to recite creation of a DC bias as supported in filed Claim 17. However, this claim has been canceled so the rejection is moot.

The Examiner has rejected Claim 16 under 35 USC §112, ¶2 for indefiniteness because, he states, the definition of process window is unclear. Both the claim and the supporting passage on page 13 have been amended to create a specific definition. If the Examiner objects to the amendment to the text, he is invited to discuss with the undersigned attorney canceling of Claim 16 by Examiner's amendment.

The Examiner has rejected Claims 1-4, 12-14, and 16-16 under 35 USC §103(a) as being obvious over US Patent 6,174,451 to Hung et al. (hereinafter, Hung) in view of US Patent 5,770,098 to Araki et al. (hereinafter, Araki). The Examiner has rejected Claims 1 and 2 under 35 USC §103(a) as being obvious over Japanese Patent Publication Hei 9-191002 (hereinafeter, Fukuto) in view of Araki. The Examiner has rejected Claims 1, 2, 12-14, and 17-20 under 35 USC §103(a) as being obvious over US Patent 6,069,092 to Imai et al. (hereinafter, Imai) in view of Fukuta. The Examiner has rejected Claims 1, 2, 12-14, and 17-20 under 35 USC §103(a) as being obvious over Araki in view of Fukuta.

Claims 3, 4, and 17-20 have been canceled. The subject matter of Claim 15 has been incorporated into Claim 1. Accordingly, these rejections are now moot. However, Claims 1 and

21 have been generalized from xenon to a broader chemically inactive diluent gas. The restriction to xenon reappears in newly added Claims 30 and 33.

The Examiner has stated that Claim 15 would be allowable if rewritten in independent form. It has been rewritten as amended Claim 1 so that the base claim and its dependent claims should be allowed.

The Examiner has allowed Claims 21-29. As stated above, Claim 21 has been generalized in the choice of diluent gas.

The undersigned attorney expresses his appreciation for the helpful discussions in the personal interview of December 3, 2001.

In view of the above amendments and remarks, reconsideration and allowance of all claims are respectfully requested. If the Examiner believes that a telephone interview would be helpful, he is invited to contact the undersigned attorney at the listed telephone number, which is on California time.

Respectfully submitted,

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Version with markings to show changes made

In the specification:

Paragraph at page 5, lines 2-16:

An example of an inductively coupled plasma etch reactor is the Inductive Plasma Source (IPS) etch reactor, which is available from Applied Materials and which Collins et al. describe in U.S. Patent Application, Serial No. 08/733,544, filed October 21, 1996 and in European Patent Publication EP-840,365-A2. As shown in FIG. 3, a wafer 30 to be processed is closely supported on a cathode pedestal 32 supplied with RF power from a first RF power supply 34 to create a DC bias. A silicon ring 36 surrounds the pedestal 32 and is controllably heated by an array of heater lamps 38. A grounded silicon wall 40 surrounds the plasma processing area. A silicon roof 42 overlies the plasma processing area, and lamps 44 and water cooling channels 46 control its temperature. In the described embodiments, the silicon roof 42 is grounded, but it may be separately RF biased for other applications. The volume of the vacuum processing chamber is about 23 liters. The temperature-controlled silicon ring 36 and silicon roof 42 may be used to scavenge fluorine from the fluorocarbon plasma. For some applications, fluorine scavenging can be accomplished by a solid carbon body, such as amorphous or graphitic carbon, or by other non-oxide silicon-based or carbon-based materials, such as silicon carbide.

Paragraph at page 13, line 23 to page 14, line 13:

A C_4F_6 process flow window was established in a SAC structure for a lower bias power of 1400W. At 10sccm of C_4F_6, the oxide etch rate is slow, but the nitride corner selectivity is very good. At 12sccm, the etch rate has improved, and this would probably represent the best C_4F_6 flow. At 14sccm, a little oxide bottom corner tapering is observed. At 16sccm, etch stop in the small side gap is beginning but is not severe. However, at 20sccm, the etch stop is complete at about half way down the small side gap. Thus, a total flow window of about 4sccm is observed at a C_4F_6 flow of 12sccm, that is, a total process window of about 33% [25%] around

and with respect to the central value within the window. The flow window should translate to the slightly different conditions of TABLE 2.

Replace all claims with:

1. (Twice Amended) A process for etching an oxide layer in the presence of a nitride layer, wherein said oxide layer is preformed with holes extending downwardly from a top surface thereof and corners of said oxide layer at tops of said holes are exposed during the process, said process comprising the steps of:

flowing into a plasma reaction chamber a gas mixture comprising a first amount of hexafluorobutadiene and a second amount of a chemically inactive diluent gas [xenon] and including substantially no carbon monoxide, wherein a ratio of said second amount to said first amount is at least one;

applying a first level of RF power to a pedestal electrode supporting a substrate containing said oxide and nitride layers; and

exciting said gas mixture into a plasma to thereby selectively etch said oxide layer to said nitride layer.

Please cancel Claims 3 and 4:

Please cancel Claim 15.

Please cancel Claims 17-20.

21. (Amended) A process for etching an oxide layer preformed with holes extending downwardly from a top surface thereof, comprising the steps of:

flowing into a plasma reaction chamber a gas mixture comprising a first amount of a fluorine-containing gas and a second amount of a chemically inactive diluent gas [xenon],

wherein a ratio of said second amount to said first amount is at least one;

applying a first level of RF power to a pedestal electrode supporting a substrate containing said oxide and non-oxide layer; and

exciting said gas mixture into a plasma to etch said oxide layer, wherein corners of said oxide layer at tops of said holes are exposed during the process.

Please add the following new claims:

30. (New) The process of Claim 1, wherein said chemically inactive diluent gas is xenon.

31. (New) The process of Claim 1, wherein said chemically inactive diluent gas is argon.

32. (New) The process of Claim 21, wherein said chemically inactive diluent gas is xenon.

33. (New) The process of Claim 21, wherein said chemically inactive diluent gas is argon.